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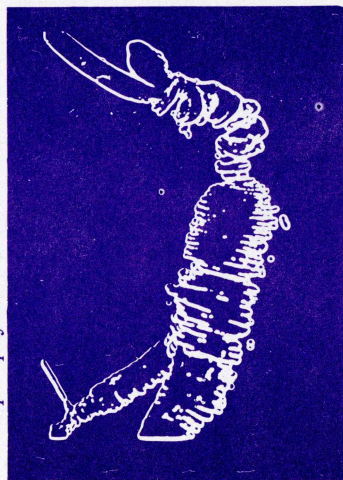
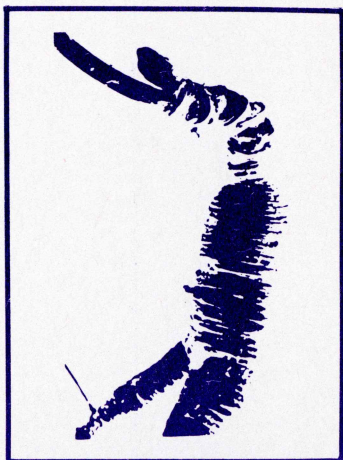
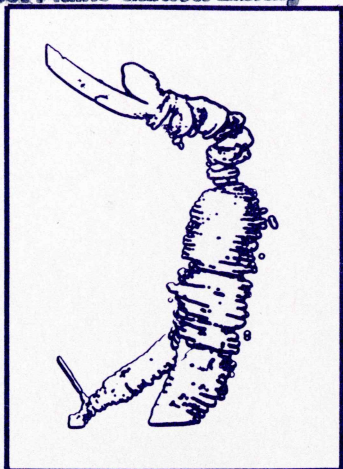
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# American ginseng: A forest crop

by Walter H. Lewis



*Panax quinquefolium* L.

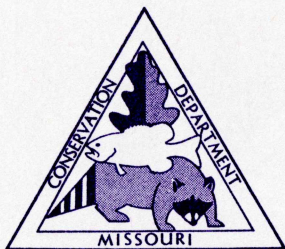
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# American ginseng: A forest crop

American ginseng (*Panax quinquefolium* L.) grows wild in the eastern half of North America. This perennial herb inhabits hardwood forests on well-drained, north- and east-facing slopes in predominantly porous, humus-rich soils. Ginseng also grows on southwest-facing slopes, in soil where sand or clay is characteristic, and in forests with conifers and softwoods, but most wild populations thrive in upland, north- and east-facing woods where shade and loam soils are typical.

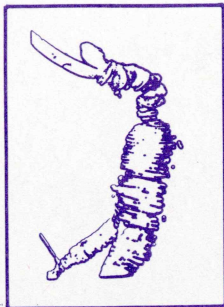
Wild and cultivated ginseng produce an annual crop in the United States and Canada valued in excess of \$25 million. The price of wild root is about three times that of cultivated root. Because ginseng root is valuable, many overzealous collectors dig all plants from wild populations. They often fail to reseed, and as a consequence, there is serious concern about the survival of American ginseng in the forest ecosystem. Some diggers consider wild ginseng free to exploit, but such collecting is a criminal act in Missouri and many other states unless one owns the land or has permission to dig.

By comparison, the intensive culture of field-cultivated ginseng is an expensive venture, requiring valuable land, high-cost artificial shade and costly maintenance for four or five years before a harvest. These costs are beyond the capacity of most potential growers. Is there an alternative to commercial collection of wild ginseng that will help conserve the species in its natural habitat while providing an income for the ginseng grower with a modest investment? There is, and that choice is woods-grown ginseng.

Woods-grown refers to the use of a natural forest canopy for shade. Cultural techniques vary from simulating forest conditions (wild-simulated ginseng growing) to approximating the practices used in culturing ginseng under artificial shade. A grower should adopt those procedures compatible with his circumstances. But the more limited his yearly investment in time and capital, the more reasonable he will find wild-simulated ginseng growing.

Before embarking on any type of ginseng culture, growers must consider the risks, be prepared to dedicate both time and effort to the project, have another source of income and live near the growing area to discourage potential vandalism.





## Wild-simulated woods-grown ginseng

### What is a ginseng crop?

Greatest demand, largely from the Orient, is for root that is old, variously shaped and forked, moderate in size, stubby but tapering, off-white, firm when dry, and with many closely formed rings. Aged and slowly grown roots are preferred and bring the highest prices. Field-grown, sometimes heavily fertilized, cultivated roots often are harvested when relatively young. These generally lack many of the characteristics typical of wild roots, are less in demand and lower in value.

In addition, selling seeds to other growers may provide a small income several years after planting, and 1- or 2-year-old seedlings may also be sold. The seed crop may also be of value in expanding one's own plantings.

### Where does ginseng grow?

The Ozark Plateau, Appalachian-Allegheny Mountains, and river bluffs and hilly outcrops elsewhere in eastern North America abound in habitats suitable for growing ginseng. Often these areas are only marginal for growing most crops, but even small wooded ravines and hollows may be desirable areas for long-range ginseng culture.

**Site.** Choose a well-drained upland area a few square yards to an acre or more that is shady and slopes toward the north or east. For adequate drainage, soil should be light and loose with rocky or porous subsoil such as that in limestone or sandstone areas. Avoid hardpan and sites lacking good soil moisture. Sites that won't support other herbaceous growth are generally unsuitable for ginseng.

As a guide to appropriate sites, look for indicator plants, i.e., those that often grow among naturally occurring ginseng populations. Besides the usual deciduous trees (ash, basswood, elm, hickory, sugar maple, red oak and white oak), herbaceous perennials that include the rattlesnake fern (*Botrychium*), spleenworts (*Asplenium*), jack-in-the-pulpits (*Arisaema*), the May apple (*Podophyllum*) and wild gingers (*Asarum*) indicate suitable habitats.

**Shade.** Ginseng requires at least 70 percent shade to develop successfully during the season. The site must have a tree canopy. However, to maximize aeration and minimize competition, the shrubby and herbaceous understory may be trimmed or removed provided the disturbance is minimal.



## How to plant ginseng

**Soil.** Little is known of the soil requirements for wild American ginseng. It grows best in well-drained, porous soils with a topsoil rich in humus formed from hardwood and other leaf litter. Natural populations tolerate a wide range of pH, and grow in soils that vary greatly in level of other soil nutrients. Indications are that the species prefers a pH range of 5-6. The addition of lime to raise soil pH to this range may be desirable. Avoid very sandy or clayey soils.

Leaf litter is important as an organic fertilizer and for mulching. Light mulching in addition to natural leaf fall helps retain moisture, prevent leaching, maintain humus levels, and minimize frost heaving and damage. Otherwise, habitat preparation should be restricted to removing troublesome weeds and branches.

Seeds should be planted about ½-inch deep and six inches or more apart. Alternately, seeds may be scattered on the soil, after raking to remove litter and loosen the soil surface. Then recover with the litter. One- or 2-year-old seedlings can be planted, too. The hole or spade cut should be sufficiently deep to accommodate the taproot without cramping and to cover the terminal bud with one inch of soil. Roots need not be exactly vertical since wild roots frequently grow at an angle—even horizontally—in the soil.

Fall planting as early as September is recommended. If seeds are fresh and within the moist pulp of the red fruit, squeeze them out (usually two per fruit). Plant the seeds immediately so they do not dry; planted this way, many seeds (at least in the South) will germinate the following spring. They also should be disease free. Some seeds require another year before germinating. If you are cleaning many seeds, rub them on a wire screen and wash them with water to get rid of the pulp.

If fresh seeds are not available from wild populations or local growers, purchase seeds that have been properly stored since harvest (August through October) during the current or previous year. Proper storage (or stratification) consists of holding seeds under conditions that approximate the natural environment of the forest soil—a protected site that is never permitted to dry completely. Freshly extracted seeds may be mixed with equal parts of clean, damp sand and placed in a screened box (to exclude rodents), partly buried in well-drained soil, and covered with mulch to prevent drying and admit rainfall. Plant fresh or stratified seeds in the fall; spring planting is less desirable.

As a precaution, disinfect all purchased seeds and seedlings to reduce potential bacterial and fungal contaminants, particularly those obtained from large cultivated ginseng sources. Seeds may be soaked for 15



minutes in a 0.25 percent solution of potassium permanganate or for 5-10 minutes in one part Clorox to nine parts water. Flush well with clean water after soaking. Plants or seeds may be soaked for 15 minutes in captan as a disinfectant, one tablespoon per gallon of water (do not wash after soaking). Some viability may be lost, but any of these treatments could prevent major disease outbreaks. Moreover, stock from different sources should not be intermixed in the same planting sites, because disease from infected seed or seedling lots could spread throughout the entire planting. Do not replant at infected sites.

## **How to maintain ginseng**

Wild-simulated woods-grown ginseng requires little maintenance. Adding a light mulch to the natural leaf litter is appropriate. Minimal use of pesticides may be necessary if pests threaten a planting, and some use of fertilizers may prove valuable (see discussions below). Weeding out major intruders is also appropriate. Keep plants well separated for maximum aeration. As already noted, plant different stock at distinct sites and disinfect seeds purchased commercially. Foot paths for access should be included at the site.

## **When to harvest ginseng**

During the first year of growth under natural conditions, the above-ground portion of ginseng has three leaflets (like a strawberry). The second year it usually has five leaflets, and in subsequent years two, three, or four prongs with three to five leaflets in each prong. This progressive development of prongs is not necessarily annual; rather, the plant often remains in the two-prong stage for several years and even longer in the three-prong and four-prong stages. Harvesting may occur before plants reach the four-prong stage. Flowers usually develop during the two-prong stage and a limited number of fruit may mature. By the time the three-prong plants form, you can expect a full complement of 20-40 fruit.

The majority of plants grown to simulate the wild condition will not reach a desired root size and maturity until 9-10 years after planting. However, you can remove flowers annually from two- and three-prong plants to increase root size and decrease harvest time by a year or so.

If flowers are not removed, annual seed crops are possible after four or five years. Seedlings can also be sold should thinning prove necessary during the first few years.

## **How to harvest and dry ginseng**

Dig roots in the fall as the above-ground parts die back. Carefully expose the underground stem (rhizome) at the base of the above-ground portion, and follow its often horizontal length until it joins the top of the true root. Remember that the taproot may be forked and that it has many diffusely



branched rootlets. Expose the whole root and rhizome intact, remove loose soil, and as soon as possible wash, but do not scrub, the remaining soil from the root (a little soil left around the root rings may enhance its value).

Spread cleaned roots on screen racks for drying. Turn them frequently and provide adequate aeration. Drying time varies with root size and drying techniques: large roots require three or more weeks to dry at room temperature or outdoors, but small roots dry in a few days. More rapid drying is possible, with artificial heat at about 90°F, using exhaust fans to expel moisture. Do not oven dry; such drying is too rapid and roots may discolor. Store dried roots in a dry, airy, rodent-proof place until ready for sale.

Usually the price for roots is best between November and April, but since price often fluctuates sharply, a grower should sell cautiously even during this period.



## Cultivated woods-grown ginseng

Except for the choice of habitat, growing cultivated ginseng in the woods differs markedly from growing wild-simulated ginseng. Even site details vary. A larger continuous area for intensive cultivation may be desirable, and a radical removal of all understory (small trees) and even some larger trees may be necessary. A canopy shade of more than 70 percent must be maintained.

The more intensively cultured plantings of ginseng seek to maximize yield in minimum time. They minimize competition by bedding and by growing dense plant populations. Some growers also add complete fertilizers and/or organic fertilizers.

Soil is tilled to a depth of six to eight inches. Lime may be added to adjust pH to 5.5 or higher. Some growers add a balanced fertilizer, such as 14-14-14, before planting; organic fertilizers may also be added. Four- to six-foot wide beds are elevated six to eight inches with a low walkway between them for maximum water runoff. In addition, beds should slope gently downhill so that roots never stand in water. Beds should not be elevated on steeper slopes where serious erosion could occur.

Seeds (or seedlings) are usually planted closer than six inches (only two to three inches apart when simulating field-grown conditions) in rows 6-12 inches apart at a depth of ½ inch. Beds are then covered with one to two



inches of leaf mulch or clean straw. Fresh or stratified seeds and seedlings preferably should be planted in the fall after disinfecting all stock purchased from large commercial sources.

Organic and chemical fertilizers enhance plant growth, but the more they are used, the more the roots will resemble the lower valued field-grown ginseng. A topdressing of balanced or complete chemical fertilizers as well as organic fertilizers such as bone meal or blood meal (repellant to deer and rabbits) can be added periodically during the growing season. Cover beds annually in the fall with leaf mulch or clean straw.

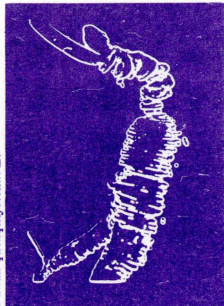
Growers recommend weeding beds routinely, removing flowers as desired and applying pesticides. Application of fungicides, particularly for stem and leaf blight (*Alternaria*), may be necessary weekly when rain or dew is heavy. Some growers suggest maneb (e.g., dithane M-22). Plants heavily infected with *Alternaria* may be removed, soaked in maneb solution and planted away from the main site. Additionally, insecticides may be needed to control lygus bug, white fly, aphid, leaf beetle and other insects. Growers variously recommend the organophosphate malathion or the plant-derived biodegradable pyrethrum or rotenone. Since pesticides don't affect some diseases of ginseng, diseased-appearing plants should be removed and destroyed as soon as they are observed. Use of pesticides should be minimal during the final year of growth before harvesting.

Larger animals also may be serious pests. Moles, mice and slugs can be destroyed with poison baits placed in appropriate holes or on paths and beds. It may be necessary to surround each site with a vertical metal shield buried one foot in the ground and exposed about two feet above ground to keep out the majority of these pests.

You can harvest roots using a potato digger or by hand with an appropriate tool. Drying procedures parallel those described above.

For reasons not understood, it is not always possible to culture a second crop of cultivated, densely grown ginseng at the same site as the original crop. This is a concern in the northern United States, Ontario and parts of Asia. Apparently, it is less important in the southern United States where growers report three successive crops of ginseng before a major reduction in production occurs, and others produce good crops after fallow periods of two years.





## Where to buy seeds and seedlings

Seeds are best obtained locally from natural populations or from nearby growers whose stock originates locally. Additionally, the following usually have stock for sale.

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W.H. Collins  
Collins Gardens  
Box 48  
Viola, IA 52350  
319/854-6609

Morris Pickerel, Sr.  
Green Gold Ginseng Co.  
Crawford Street  
Thompkinsville, KY 42167  
502/487-6441

Barney L. Frye  
Barney's Ginseng Patch  
Route 2, Box 43  
Montgomery City, MO 63361  
314/564-2575

Billy E. English  
American Ginseng Gardens  
Route 1, Box 440  
Flag Pond, TN 37657  
615/743-3700

## **Additional information on ginseng**

The following publication is available free of charge:  
Wild American Ginseng  
Missouri Department of Conservation  
P.O. Box 180  
Jefferson City, MO 65102-0180.